

CLAIMS

1. An induction heating coil for heating a shaft member having multiple steps, comprising: annular conductors separately disposed in the axis direction and having inner diameters which form predetermined gaps with outer peripheries of heating portions of the shaft member, wherein the lengths of the annular conductors are set so that the areas of the respective heating portions are approximately equal to each other, and the annular conductors are connected to each other in series so as to uniformly increase temperatures of respective step shaft portions of the shaft member.

2. The induction heating coil for heating a shaft member having multiple steps, according to Claim 1, wherein at least one of the annular conductors has a step shape corresponding to steps of the shaft member which have different outer diameters so as to uniformly increase temperatures of the step shaft portions of the shaft member.

3. The induction heating coil for heating a shaft member having multiple steps, according to Claim 1 or 2, wherein at least one annular protrusion is provided for at least one of the annular conductors at a place corresponding to a root of

a step of the shaft member so as to also heat the root of the step.

4. An induction heating method for heating a shaft member having multiple steps by using an induction heating coil which comprises annular conductors separately disposed in the axis direction and having inner diameters so as to form predetermined gaps with outer peripheries of heating portions of the shaft member, the lengths of the annular conductors being set so that the areas of the respective heating portions are approximately equal to each other, and the annular conductors being connected to each other in series, the induction heating method comprising the step of uniformly increasing temperatures of step shaft portions of the shaft member.

5. The induction heating method for heating a shaft member having multiple steps by using the induction heating coil, according to Claim 4, wherein at least one of the annular conductors has a step shape corresponding to steps of the shaft member which have different outer diameters so as to uniformly increase temperatures of the step shaft portions of the shaft member.

6. The induction heating method for heating a shaft

member having multiple steps by using the induction heating coil, according to Claim 4 or 5, wherein at least one annular protrusion is provided for at least one of the annular conductors at a place corresponding to a root of a step of the shaft member so as to also heat the root of the step.